CONTENTS

PHYSICS DEPT. LIBRARY

INDEX 501

MATHEMATICS

ON THE SUBDIVISION OF 3-SPACE BY A POLYHEDRON ..... *By J. W. Alexander* 6
AN EXAMPLE OF A SIMPLY CONNECTED SURFACE BOUNDING A REGION WHICH IS NOT SIMPLY CONNECTED ..... *By J. W. Alexander* 8
REMARKS ON A POINT SET CONSTRUCTED BY ANTOINE ..... *By J. W. Alexander* 10
SETS OF COMPLETELY INDEPENDENT POSTULATES FOR CYCLIC ORDER ..... *By E. V. Huntington* 74
NEW TOPOLOGICAL INVARIANTS EXPRESSIBLE AS TENSORS ..... *By J. W. Alexander* 99
ON CERTAIN NEW TOPOLOGICAL INVARIANTS OF A MANIFOLD ..... *By J. W. Alexander* 101
CONDITION THAT AN ELECTRON DESCRIBE A GEODESIC ..... *By Arthur Bramley* 103
ELECTRODYNAMICS IN THE GENERAL RELATIVITY THEORY ..... *By G. Y. Rainich* 124
PRINCIPAL DIRECTIONS IN AN AFFINE-CONNECTED MANIFOLD OF TWO-DIMENSIONS ..... *By J. L. Synge* 127
PRIME POWER SUBSTITUTION GROUPS WHOSE CONJUGATE CYCLES ARE COMMUTATIVE ..... *By G. A. Miller* 166
AN EXTENSION OF THE THEOREM THAT NO COUNTABLE POINT SET IS PERFECT ..... *By R. L. Moore* 168
CONCERNING THE PRIME PARTS OF CERTAIN CONTINUA WHICH SEPARATE THE PLANE ..... *By R. L. Moore* 170
CONCERNING THE DIVISION OF THE PLANE BY CONTINUA ..... *By John Robert Kline* 176
ON PARAMETRIC REPRESENTATIONS OF CONTINUOUS SURFACES ..... *By B. de Kerékjártó* 267
SECOND NOTE: ELECTRODYNAMICS IN THE GENERAL RELATIVITY THEORY ..... *By G. Y. Rainich* 294
CONCERNING UPPER SEMI-CONTINUOUS COLLECTIONS OF CONTINUA WHICH DO NOT SEPARATE A GIVEN CONTINUUM ..... *By R. L. Moore* 356
CONCERNING SETS OF SEGMENTS WHICH COVER A POINT SET IN THE VITALI SENSE ..... *By R. L. Moore* 464
A GENERAL TYPE OF SINGULAR POINT ..... *By Einar Hille* 488
TOPOLOGICAL INVARIANTS OF MANIFOLDS ..... *By J. W. Alexander* 493

ASTRONOMY

SPECTRA OF METEOR TRAINS ..... *By C. C. Trowbridge* 24
THE LAW OF SUN-SPOT POLARITY ..... *By G. E. Hale* 53
AN EXPLANATION OF THE GAPS IN THE DISTRIBUTION OF THE ASTEROIDS ACCORDING TO THEIR PERIODS OF REVOLUTION ..... *By E. W. Brown* 248
NOTE ON THE DIFFERENCE IN VELOCITY BETWEEN ABSOLUTELY BRIGHT AND FAINT STARS ..... *By J. H. Oort* 253
ON A POSSIBLE RELATION BETWEEN GLOBULAR CLUSTERS AND STARS OF HIGH VELOCITY ..... *By J. G. Oort* 256
NOTE ON SOME STATISTICAL CONSEQUENCES OF THE LUMINOSITY LAW ..... *By W. J. Luyten* 260
ATMOSPHERIC PULSATION OF THE CEPHEID VARIABLE η AQUILAE ..... *By W. C. Rufus* 264
A SYNOPSIS OF THE IONIZATION POTENTIALS OF THE ELEMENTS ..... *By Cecilia H. Payne* 323
THE SPECTROHELIOSCOPE ..... *By George E. Hale* 361
NOTE ON THE PRESSURE AND CURRENTS IN THE SUN'S ATMOSPHERE ..... *By C. E. St. John and H. D. Babcock* 389

75855

CONVECTION CURRENTS IN STELLAR ATMOSPHERES ..... *By C. E. St. John and W. S. Adams* 392

STATISTICS

THE DEVELOPMENT OF A FREQUENCY FUNCTION AND SOME COMMENTS ON CURVE FITTING ..... *By E. B. Wilson* 79
A STATISTICAL DISCUSSION OF SETS OF PRECISE ASTRONOMICAL MEASUREMENTS: PARALLAXES ..... *By Edwin B. Wilson and Willem J. Luyten* 129
IS PNEUMONIA INCREASING? ..... *By Ewald Tomanek and Edwin B. Wilson* 161
A STATISTICAL DISCUSSION OF SETS OF PRECISE ASTRONOMICAL MEASUREMENTS. II. PROPER MOTIONS ..... *By E. B. Wilson and Willem J. Luyten* 228
THE INFLUENCE OF ALCOHOL ON DURATION OF LIFE ..... *By R. Pearl* 231
A STATISTICAL DISCUSSION OF SETS OF PRECISE ASTRONOMICAL MEASUREMENTS. III. MASSES OF THE STARS ..... *By E. B. Wilson and W. J. Luyten* 394
A STATISTICAL DISCUSSION OF SETS OF PRECISE ASTRONOMICAL MEASUREMENTS. IV. THE MASS-RATIO IN BINARIES ..... *By E. B. Wilson and W. J. Luyten* 433

PHYSICS

VIBRATION IN SPARK-BLOWN CLOSED QUILL TUBES. ELECTRIC OSCILLATION .... *By C. Barus* 1
NOTE ON ELECTRICALLY EXPLODED WIRES IN HIGH VACUUM ..... *By S. Smith* 4
ON TERTIARY X-RADIATION, ETC ..... *By G. L. Clark and W. Duane* 41
FURTHER EXPERIMENTS UPON THE REFLECTION BY A CRYSTAL OF ITS CHARACTERISTIC X-RADIATION ..... *By G. L. Clark and W. Duane* 47
THE SCATTERING OF X-RAYS AND BRAGG'S LAW ..... *By G. E. M. Jauncey* 57
REFRACTION OF X-RAYS IN PYRITES ..... *By B. Davis and R. von Nardroff* 60
DURATION OF MOLECULES IN UPPER QUANTUM STATES ..... *By Richard C. Tolman* 85
ON THERMAL EMISSION AND EVAPORATION FROM WATER ..... *By Mildred Allen* 88
ON SECONDARY AND TERTIARY X-RAYS FROM GERMANIUM, ETC ..... *By George L. Clark and William Duane* 92
EXHIBIT OF TELEPHONIC EXCITATION OF ACOUSTIC PRESSURE ..... *By Carl Barus* 96
THE QUANTUM THEORY OF THE FRAUNHOFER DIFFRACTION ..... *By P. S. Epstein and P. Ehrenfest* 133
EFFECTIVE RADII OF GAS MOLECULES ..... *By L. L. Nettleton* 140
NOTE ON THE ABSORPTION MEASUREMENTS OF THE X-RAYS REFLECTED FROM A CALCITE CRYSTAL ..... *By Y. H. Woo* 145
THE SECONDARY AND TERTIARY RAYS FROM CHEMICAL ELEMENTS OF SMALL ATOMIC NUMBER DUE TO PRIMARY X-RAYS FROM A MOLYBDENUM TARGET .. *By George L. Clark, Wm. Duane and W. W. Stifler* 148
DENSITY AND DIFFUSION OF GASES MEASURED BY DISPLACEMENT INTERFEROMETRY ..... *By Carl Barus* 153
THE BEHAVIOR OF LOW VELOCITY ELECTRONS IN METHANE GAS ..... *By George Glockler* 155
A POSSIBLE EXPLANATION OF TERTIARY LINE SPECTRA IN X-RAYS ..... *By David L. Webster* 186
ON THE THEORY OF THE TERTIARY RADIATION PRODUCED BY IMPACTS OF PHOTO-ELECTRONS ..... *By George L. Clark and William Duane* 191
ABSORPTION MEASUREMENTS OF CERTAIN CHANGES IN THE AVERAGE WAVE-LENGTH OF TERTIARY X-RAYS ..... *By Samuel K. Allison and William Duane* 196
THE SERIES SPECTRA OF THE STRIPPED BORON ATOM (BIII) ..... *By I. S. Bowen and R. A. Millikan* 199

The Wave-Length of Molybdenum Kα Rays when Scattered by Light Elements ... *By A. H. Compton and Y. H. Woo* 271
Quantization in Space and the Relative Intensities of the Components of Infra-Red Absorption Bands ... *By E. C. Kemble* 274
The Ballistic (Air Resistance) Function ... *By L. Thompson* 279
The Reflection of Characteristic Bromine X-Radiation by a Crystal of Potassium Bromide ... *By S. K. Allison and William Duane* 298
Quantitative Theory of the Influence Electrostatic Generator ... *By Alfred W. Simon* 302
Scattered X-Rays ... *By P. A. Ross* 304
On the Simultaneous Jumping of Two Electrons in Bohr's Model ... *By Paul S. Epstein* 337
The Compton and Duane Effects ... *By Joseph A. Becker* 342
Coulomb's Law and the Hydrogen Spectrum ... *By Edwin B. Wilson* 346
Density and Diffusion Measurement by Displacement Interferometry in Extreme Cases ... *By Carl Barus* 349
Ionic Mobilities in Gaseous Mixtures ... *By L. B. Loeb and M. F. Ashley* 351
The Derivation of Electromagnetic Fields from a Basic Wave-Function ... *By H. Bateman and P. Ehrenfest* 369
The Influence on Secondary X-Ray Spectra of Placing the Tube and Radiator in a Box ... *By A. H. Armstrong, W. Duane and W. W. Stifler* 374
The Influence on Secondary X-Ray Spectra of Placing the Tube and Radiator in a Box ... *By S. K. Allison, G. L. Clark and W. Duane* 379
Further Experiments on the Refraction of X-Rays in Pyrites ... *By B. Davis and R. von Nardroff* 384
An Improved Method of Measuring the Specific Heats of Metals at High Temperatures ... *By K. K. Smith and L. I. Bockstahler* 386
The Polarization Angle X-Rays Scattered by Paraffin ... *By G. M. Jauncey and H. E. Stauss* 405
Some Properties of Single Metal Crystals ... *By P. W. Bridgman* 411
The Secondary Electrons Produced by Hard X-Rays in Light Elements ... *By Hugo Fricke and Otto Glasser* 441
The Diffusion of Hydrogen into Air Measured by the Interferometer U-Guage ... *By Carl Barus* 447
White Light Interference Fringes with a Thick Glass Plate in One Path. *By W. N. Birchby* 452
The Mobilities of the Positive Ions in Helium ... *By H. B. Wahlin* 475

ENGINEERING

Radio Fog Signals for the Protection of Navigation; Recent Progress ... *By G. R. Putnam* 211
Time Constants for Engineering Purposes in Simple Exponental Transient Phenomena ... *By A. E. Kennelly* 467

CHEMISTRY

The Constitution of Columbia Yellow (Chloramine Yellow) ... *By Marston Taylor Bogert and Frank H. Bergeim* 319
The Constitution of the So-Called "Pechmann Dyes" and the Mechanism of Their Formation from Beta-Benzoylacrylic Acid ... *By M. T. Bogert and J. J. Ritter* 363
The Ionization Potentials of Hydrogen as Interpreted by Positive Ray Analysis ... *By T. R. Hogness and E. G. Lunn* 398

THE COMBINATION OF HYDROGEN AND OXYGEN IN THE PRESENCE OF ACTIVATED MERCURY ..... *By R. G. Dickinson* 409
EFFECT OF INSULIN ON THE LACTIC FERMENTATION ..... *By Arthur A. Noyes and Howard W. Estill* 415
A NEW GROUP OF DYES FROM POISON GASES THROUGH THE 2-AMINOTHIAZOLES AS INTERMEDIATES. THE PREPARATION OF THIAZOLE DYES OF DOEBNER VIOLET TYPE ..... *By M. T. Bogert and Moses Chertcoff* 418
THE SYNTHESIS OF TEREPHTHAL GREEN AND TEREPHTHAL BRILLIANT GREEN FROM CYMENE ..... *By M. T. Bogert and P. S. Nisson* 421
FURTHER EXPERIMENTS IN THE FIELD OF THE TEREPHTHALIC ACID DERIVATIVES. *By M. T. Bogert and P. S. Nisson* 426
THE SEPARATION OF ISOTOPES BY THE IONIC MIGRATION METHOD ..... *By James Kendall and James F. White* 458
THE DENSITY OF OXYGEN ..... *By G. P. Baxter and H. W. Starkweather* 479

GEOLOGY AND PALEONTOLOGY

DISCOVERIES DURING THE SEASON OF 1923 BY THE THIRD ASIATIC EXPEDITION IN MONGOLIA ..... *By H. F. Osborn* 23
THE FORMATION OF THE LESSER ANTILLES ..... *By W. M. Davis* 205

PETROLOGY

ON A STONY METEORITE FROM ANTHONY, HARPER COUNTY, KANSAS AND A RECENTLY FOUND METEORIC IRON FROM MEJILLONES, CHILE ..... *By George P. Merrill* 306
ON A METEORIC IRON FROM FOUR CORNERS, SAN JUAN COUNTY, NEW MEXICO ... *By George P. Merrill* 312

ZOÖLOGY

A STUDY OF THE INTERACTION OF HOST AND PARASITE: A REACTION PRODUCT IN INFECTIONS WITH TRYPANOSOMA LEWISI WHICH INHIBITS THE REPRODUCTION OF THE TRYPANOSOMES ..... *By W. H. Taliaferro* 12
RETARDED ESTABLISHMENT OF INTRODUCED PARASITES OF INJURIOUS INSECTS ... *By L. O. Howard* 16
THE EFFECTS OF REPLACING THE CEPHALIC END OF THE EMBRYONIC SPINAL CORD BY AN EXTRANEOUS MEDULLA IN AMBLYSTOMA ..... *By S. R. Detwiler* 64
SOME UNEXPECTED RESULTS OF THE HETEROPLASTIC TRANSPLANTATION OF LIMBS ..... *By R. G. Harrison* 69
ON THE LONGEVITY OF SPATHIDIUM SPATHULA WITHOUT ENDOMIXIS OR CONJUGATION ..... *By Lorande Loss Woodruff and Lucile Moore* 183
TWO EXTRAORDINARY LARVAL MYRMECOPHILES FROM PANAMA *By W. J. Wheeler* 237
OBSERVATIONS ON THE FAUNA OF THERMAL WATERS ..... *By C. T. Brues* 484

BOTANY

RUPPIA AND ITS ENVIRONMENTAL FACTORS ..... *By W. A. Setchell* 286

GENETICS

DOES THE INHERITANCE OF DIFFERENCES IN GENERAL SIZE DEPEND UPON GENERAL OR SPECIAL SIZE FACTORS? ..... *By W. E. Castle* 19
LINKAGE OF DUTCH, ENGLISH AND ANGORA IN RABBITS ..... *By W. E. Castle* 107
DISTINCTION BETWEEN PRIMARY AND SECONDARY CHROMOSOMAL MUTANTS IN DATURA ..... *By Albert F. Blakeslee* 109
THE CONFIGURATIONS AND SIZES OF THE CHROMOSOMES IN THE TRIVALENTS OF 25-CHROMOSOME DATURAS ..... *By James W. Belling and Albert F. Blakeslee* 116

INHERITANCE IN NICOTIANA TABACUM V. THE OCCURRENCE OF HAPLOID PLANTS IN INTERSPECIFIC PROGENIES.....*By Roy E. Clausen and Margaret C. Mann* 121
THE PARTIAL GENETIC INDEPENDENCE IN SIZE OF THE VARIOUS PARTS OF THE BODY.....*By F. B. Sumner* 178
ARE THE VARIOUS PARTS OF THE BODY GENETICALLY INDEPENDENT IN SIZE?.....
By W. E. Castle 181
SELECTIVE FERTILIZATION AMONG THE GAMETES FROM THE SAME INDIVIDUALS...
By D. F. Jones 218
THE JAPANESE RABBIT AND GAMETIC PURITY.....*By W. E. Castle* 222
THE NATURE OF SIZE INHERITANCE.....*By K. Sax* 224
THE INHERITANCE OF A RETINAL ABNORMALITY IN WHITE MICE.....
By Clyde E. Keeler 329
ON THE OCCURRENCE IN RABBITS OF LINKAGE IN INHERITANCE BETWEEN ALBINISM AND BROWN PIGMENTATION.....*By W. E. Castle* 486

PHYSIOLOGY

THE ROLE OF ADRENAL SECRETION IN THE CHEMICAL CONTROL OF BODY TEMPERATURE.....*By W. B. Cannon and A. Querido* 245
INCREASE OF ADRENAL SECRETION IN FEVER.....
By W. B. Cannon and J. R. Pereira 247
NOTE ON THE THERMOKINETICS OF DOLICHODERINE ANTS.....
By Harlow Shapley 436
ON THE POSSIBILITY OF IDENTIFYING CHEMICAL PROCESSES IN LIVING MATTER...
By W. J. Crozier 461
THE NEUTRAL BATH AND ITS RELATION TO BODY HEAT.....
By F. G. Benedict and C. G. Benedict 495
BODY POSTURE AND MINOR MUSCULAR MOVEMENTS.....
By F. G. Benedict and C. G. Benedict 498

PSYCHOLOGY AND ANTHROPOLOGY

HISTORICAL TRADITION AND ORIENTAL RESEARCH.....*By James Henry Breasted* 289
ACTION OF DILUTE ALCOHOL ON HUMAN SUBJECTS.....*By W. R. Miles* 334